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21 March 1997

AGREEMENT

CONCERNING THE ADOPTION OF UNIFORM TECHNICAL PRESCRIPTIONS FOR WHEELED VEHICLES, EQUIPMENT AND PARTS WHICH CAN BE FITTED AND/OR BE USED ON WHEELED VEHICLES AND THE CONDITIONS FOR RECIPROCAL RECOGNITION OF APPROVALS GRANTED ON THE BASIS OF THESE PRESCRIPTIONS *

(Revision 2, including the amendments entered into force on 16 October 1995)

Addendum 53: Regulation No. 54

Revision 1

Incorporating:
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UNIFORM PROVISIONS CONCERNING THE APPROVAL OF PNEUMATIC TYRES FOR COMMERCIAL VEHICLES AND THEIR TRAILERS

UNITED NATIONS

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* Former title of the Agreement:

Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958.

GE.97-20881

Regulation No. 54

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF PNEUMATIC TYRES FOR COMMERCIAL VEHICLES AND THEIR TRAILERS

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1. SCOPE

This Regulation applies to new pneumatic tyres primarily designed for use by all road vehicles; it does not however apply to:

1.1. New tyres for private (passenger) cars and their trailers;

1.2. Tyres of a speed category below 80 km/h; or

1.3. Tyres designed for cycles and motor cycles.

2. DEFINITIONS

For the purposes of this Regulation:

2.1. "Type of pneumatic tyre" means a category of pneumatic tyres which do not differ in such essential respects as:

2.1.1. Manufacturer's name or trade mark;

2.1.2. Tyre-size designation;

2.1.3. Category of use
normal: normal-road-use tyre;
special: special-use tyre, e.g. tyre for mixed use (both on and off the road) and/or at restricted speed;
snow tyre;

2.1.4. Structure (diagonal (bias-ply); radial);

2.1.5. Speed category;

2.1.6. Load-capacity indices; and

2.1.7. Cross-section;

2.2. "Snow tyre" means a tyre whose tread pattern and whose structure are primarily designed to ensure in mud and fresh or melting snow a performance better than that of an ordinary (road-type) tyre. The tread pattern of a snow tyre generally consists of groove (rib) and/or solid block elements more widely spaced than an ordinary (road-type) tyre;

2.3. "Structure" of a pneumatic tyre means the technical characteristics of the tyre's carcass. A distinction is made between the following structures in particular:

2.3.1. "Diagonal" or "bias-ply" describes a pneumatic-tyre structure in which the ply cords extend to the beads and are laid at alternate angles substantially less than 90° to the centreline of the tread;

2.3.2. "Radial" describes a pneumatic-tyre structure in which the ply cords extend to the beads and are laid substantially at 90° to the centreline of the tread, the carcass being stabilized by an essentially inextensible circumferential belt.

2.4. "Bead" means the part of a pneumatic tyre which is of such shape and structure as to fit the rim and to hold the tyre on it; 1/

2.5. "Cord" means the strands forming the fabric of the plies in the pneumatic tyre; 1/

2.6. "Ply" means a layer of rubber-coated parallel cords; 1/

2.7. "Carcass" means that part of a pneumatic tyre other than the tread and the rubber sidewalls which, when inflated, bears the load; 1/

2.8. "Tread" means that part of a pneumatic tyre which comes into contact with the ground, protects the carcass against mechanical damage and contributes to ground adhesion; 1/

2.9. "Sidewall" means the part of a pneumatic tyre between the tread and the area designed to be covered by the rim flange; 1/

2.10. "Lower sidewall" means the area included between the line of maximum section width of the tyre and the area designed to be covered by the rim flange; 1/

2.11. "Tread groove" means the space between two adjacent ribs and/or blocks in the tread pattern; 1/

2.12. "Section width (S)" means the linear distance between the outsides of the sidewalls of an inflated pneumatic tyre, excluding elevations due to labelling (marking), decoration or protective bands or ribs; 1/

2.13. "Over-all width" means the linear distance between the outsides of the sidewalls of an inflated pneumatic tyre, including labelling (marking), decoration and protective bands or ribs; 1/

2.14. "Section height (H)" means a distance equal to half the difference between the outer diameter of the tyre and the nominal rim diameter;

2.15. "Nominal aspect ratio (Ra)" means one hundred times the number obtained by dividing the number expressing the section height (H) by the number expressing the nominal section width (S_1), both dimensions expressed in the same units;

1/ See explanatory figure.

2.16. "Outer diameter (D)" means the overall diameter of an inflated new pneumatic tyre; 1/

2.17. "Tyre-size designation" means

2.17.1. A designation showing:

2.17.1.1. The nominal section width (S_1). This width must be expressed in mm, except in the case of types of tyre for which the size designation is shown in the first column of the tables in annex 5 to this Regulation;

2.17.1.2. The nominal aspect ratio, except in the case of certain types of tyre for which the size designation is shown in the first column of the tables in annex 5 to this Regulation;

2.17.1.3. A conventional number "d" (the "d" symbol) denoting the nominal diameter of the rim and corresponding to its diameter expressed either in codes (number below 100) or in millimetres (numbers above 100). Numbers corresponding to both types of measurement may be used together in the designation;

1/ See explanatory figure.

2.17.1.3.1. The values of the "d" symbols expressed in millimetres are shown below:

Nominal rim diameter code ("d" symbol)	Value of the "d" symbol expressed in mm
8	203
9	229
10	254
11	279
12	305
13	330
14	356
15	381
16	406
17	432
18	457
19	482
20	508
21	533
22	559
24	610
25	635
14.5	368
16.5	419
17.5	445
19.5	495
20.5	521
22.5	572
24.5	622

2.18. "Nominal rim diameter (d)" means the diameter of the rim on which a tyre is designed to be mounted; 1/

2.19. "Rim" means the support for a tyre-and-tube assembly, or for a tubless tyre, on which support the tyre beads are seated; 1/

2.20. "Theoretical rim" means a rim whose width would be equal to x times the nominal section width of a tyre; the value of x shall be specified by the manufacturer of the type;

2.21. "Measuring rim" means the rim on which a tyre must be fitted for dimensional measurements;

2.22. "Test rim" means the rim on which a tyre must be fitted for load/speed endurance testing;

1/ See explanatory figure.

2.23. "Chunking" means the breaking away of pieces of rubber from the tread;

2.24. "Cord separation" means the parting of the cords from their coating;

2.25. "Ply separation" means the parting of adjacent plies;

2.26. "Tread separation" means the pulling away of the tread from the carcass;

2.27. "Load capacity index" means one or two numbers which indicate the load the tyre can carry in single or in single and dual operation at the speed corresponding to the associated speed category and when operated in conformity with the requirements governing utilization specified by the manufacturer. A type of pneumatic tyre can have either one or two sets of load capacity indices depending on whether or not the provisions of paragraph 6.2.5. are applied. The list of these indices and their corresponding loads is given in annex 4;

2.28. "Speed category" means:

2.28.1. The speeds, indicated by a symbol, at which the tyre can carry the load indicated by the associated load capacity index;

2.28.2. The speed categories are as shown in the table below: 2/

Speed-category symbol	Corresponding speed (km/h)
F	80
G	90
J	100
K	110
L	120
M	130
N	140
P	150
Q	160
R	170
S	180
T	190
U	200
H	210

2/ For consistency, the symbols and speeds shown in this table are the same as those for passenger cars (as in Regulation No. 30). They should not be taken to indicate the speeds at which commercial vehicles fitted with such tyres may be operated on the roads.

2.29. "Table load-capacity variation with speed" means:

The table, in annex 8, showing as a function of the load-capacity indices and nominal-speed-category symbols the load variations which a pneumatic tyre can withstand when used at speeds different from that conforming to its nominal-speed-category symbol. The load variations do not apply in the case of the additional load capacity symbol and speed category obtained when the provisions of paragraph 6.2.5. are applied.

3. MARKINGS

3.1. Pneumatic tyres submitted for approval shall display on both sidewalls in the case of symmetrical tyres and at least on the outer sidewall in the case of asymmetrical tyres:

3.1.1. The manufacturer's name or trade mark;

3.1.2. The tyre-size designation as defined in paragraph 2.17. of this Regulation;

3.1.3. An indication of the structure as follows:

3.1.3.1. On diagonal (bias-ply) tyres: no indication, or the letter "D";

3.1.3.2. On radial-ply tyres: the letter "R" placed in front of the rim-diameter marking and, optionally, the word "RADIAL";

3.1.4. The speed-category symbol (or symbols);

3.1.4.1. An indication of the tyre's nominal speed category in the form of the symbol prescribed in paragraph 2.28.2. above;

3.1.4.2. An indication of a second speed category in cases where paragraph 6.2.5. below is applied;

3.1.5. The inscription M+S or M.S or M&S in the case of a snow tyre;

3.1.6. The load-capacity indices as defined in paragraph 2.27. of this Regulation;

3.1.7. The word "TUBELESS" if the tyre is designed for use without an inner tube;

3.1.8. The date of manufacture in the form of a group of four digits, the first two showing the week and the last two the year of manufacture. However, this marking, which it is permissible to restrict to one sidewall, shall not be mandatory, on any tyre

submitted for approval, until two years after the date of entry into force of this Regulation; 3/

3.1.9. In the case of tyres which can be regrooved, the symbol "Ū" at least 20 mm in diameter, or the word "REGROOVABLE", moulded into or on to each sidewall;

3.1.10. An indication, by the "PSI" index, of the inflation pressure to be adopted for the load/speed endurance tests, as explained in annex 7, appendix 2. However, this indication, which it is permissible to restrict to one sidewall, shall not be mandatory, on any tyre submitted for approval, until two years after the date of entry into force of this Regulation.

3.1.11. An identification of the tyre to rim fitment configuration when it differs from the standard configuration and is not already expressed by the symbol "d" denoting the nominal rim diameter code.

3.2. Tyres shall exhibit a free space sufficiently large to accommodate an approval mark as shown in annex 2 to this Regulation.

3.3. Annex 3 to this Regulation gives an example of an arrangement of the tyre markings.

3.4. The markings referred to in paragraph 3.1. and the approval mark prescribed in paragraph 5.4. of this Regulation shall be moulded on to or into the tyres. They shall be clearly legible and shall, except for the marking referred to in paragraph 3.1.1. above, be located on at least one lower sidewall.

4. APPLICATION FOR APPROVAL

4.1. The application for approval of a type of pneumatic tyre shall be submitted by the holder of the manufacturer's name or trade mark or by his duly accredited representative. It shall specify:

4.1.1. The tyre-size designation as defined in paragraph 2.17. of this Regulation;

4.1.2. The manufacturer's name or trade mark;

4.1.3. The category of use (normal or special or snow);

4.1.4. Structure: diagonal (bias ply) or radial;

4.1.5. The speed category;

3/ Before 1 January 2000, the date of manufacture may be indicated by a group of three digits, the first two showing the week and the last one the year of manufacture.

4.1.6. The load-capacity indices;

4.1.7. Whether the tyre is intended to be used with or without an inner tube;

4.1.8. The overall dimensions: overall section width and outer diameter;

4.1.9. The factor "x" referred to in paragraph 2.20. above;

4.1.10. The rims on which the tyre can be mounted;

4.1.11. The measuring rim and test rim;

4.1.12. The measuring pressure and test pressure index;

4.1.13. The additional load/speed combinations in cases where paragraph 6.2.5. below is applied.

4.2. The application for approval shall be accompanied (all in triplicate) by a sketch, or a representative photograph, which identify the tyre tread pattern and a sketch of the envelope of the inflated tyre mounted on the measuring rim showing the relevant dimensions (see paragraphs 6.1.1. and 6.1.2.) of the type submitted for approval. It shall also be accompanied either by the test report issued by the approved test laboratory or by one or two samples of the tyre type, at the discretion of the competent authority. Drawings or photographs of the side wall and tread of the tyre shall be submitted once production has been established, no later than one year after the date of issue of the type approval.

4.3. The competent authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.

4.4. Where a tyre manufacturer submits application for type approval for a range of tyres, it is not considered necessary to carry out a load/speed test on every type of tyre in the range. Worst case selection may be made at the discretion of the approval authority.

5. APPROVAL

5.1. If the type of pneumatic tyre submitted for approval in pursuance of this Regulation meets the requirements of paragraph 6 below, approval of that type of tyre shall be granted.

5.2. An approval number shall be assigned to each type approved; its first two digits (at present 00 for the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same

Contracting Party may not assign the same number to another type of pneumatic tyre.

5.3. Notice of approval or of refusal of approval of a type of pneumatic tyre pursuant to this Regulation shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in annex 1 to this Regulation.

5.4. There shall be affixed, conspicuously, to every pneumatic tyre conforming to a type of tyre approved under this Regulation, in the space referred to in paragraph 3.2. above and in addition to the markings prescribed in paragraph 3.1. above, an international approval mark consisting of:

5.4.1. a circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval; 4/ and

5.4.2. an approval number.

5.5. The approval mark shall be clearly legible and be indelible.

5.6. Annex 2 to this Regulation gives an example of the arrangement of the approval mark.

6. SPECIFICATIONS

6.1. Dimensions of tyres

6.1.1. Section width of a tyre

6.1.1.1. The section width shall be obtained by means of the following formula:

$$S = S_1 + K (A - A_1),$$

4/ 1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15 (vacant), 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal, 22 for the Russian Federation, 23 for Greece, 24 (vacant), 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30-36 (vacant) and 37 for Turkey. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, or in which they accede to that Agreement, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

where:

S is the "section width" expressed in millimetres and measured on the measuring rim;

S_1 is "the nominal section width" in millimetres, as shown on the sidewall of the tyre in the tyre designation as prescribed;

A is the width of the measuring rim in millimetres, as shown by the manufacturer in the descriptive note; and

A_1 is the width of the theoretical rim in millimetres.

A_1 shall be taken to equal S_1 multiplied by the factor x as specified by the manufacturer, and K shall be taken to equal 0.4

6.1.1.2. However, for the existing types of tyres whose designation is given in the first column of the tables in annex 5 to this Regulation, the section width shall be deemed to be that given opposite the tyre designation in those tables.

6.1.2. Outer diameter of a tyre

6.1.2.1. The outer diameter of a tyre shall be obtained by means of the following formula:

$$D = d + 2H$$

where:

D is the outer diameter expressed in millimetres;

d is the conventional number defined in paragraph 2.17.1.3. above, expressed in millimetres;

S_1 is the nominal section width in millimetres;

Ra is the nominal aspect ratio;

H is the nominal section height in millimetres and is equal to S_1 x 0.01 Ra.

All as in the tyre designation shown on the sidewall of the tyre in conformity with the requirements of paragraph 3.4. above.

6.1.2.2. However, for the existing types of tyres whose designation is given in the first column of the tables in annex 5 to this Regulation, the outer diameter shall be deemed to be that given opposite the tyre designation in those tables.

6.1.3. Method of measuring pneumatic tyres

The dimensions of pneumatic tyres shall be measured by the procedure described in annex 6 to this Regulation.

6.1.4. Tyre section width specifications

6.1.4.1. The overall width of a tyre may be less than the section width or widths determined pursuant to paragraph 6.1.1. above.

6.1.4.2. It may exceed that value by 4 per cent in case of radial-ply tyres and by 8 per cent in the case of diagonal (bias-ply) tyres. However, for tyres of a section width exceeding 305 mm intended for dual mounting (twinning), the nominal value shall not be exceeded by more than 2 per cent for radial-ply tyres or 4 per cent for diagonal (bias-ply) tyres.

6.1.5. Tyre outer diameter specifications

The outer diameter of a tyre must not be outside the values Dmin and Dmax obtained from the following formulae:

$$Dmin = d + (2H \times a)$$
$$Dmax = d + (2H \times b)$$

where:

6.1.5.1. For sizes listed in annex 5

H = 0.5 (D-d) - for references see paragraph 6.1.2.1.

6.1.5.2. For other sizes, not listed in annex 5

"H" and "d" are as defined in paragraph 6.1.2.1.

6.1.5.3. Coefficients "a" and "b" are respectively:

6.1.5.3.1. Coefficient "a" = .97

6.1.5.3.2. Coefficient "b"

	Radial	Diagonal
for normal use tyres	1.04	1.07
for special use tyres	1.06	1.09

6.1.5.3.3. For snow tyres the outer diameter (Dmax) established in conformity with the above may be exceeded by 1 per cent.

6.2. Load/speed endurance test

6.2.1. Each type of pneumatic tyre shall undergo at least one load/speed endurance tests carried out by the procedure described in annex 7 to this Regulation.

6.2.2. A tyre which, after undergoing the endurance test, does not exhibit any tread separation, ply separation, cord separation, chunking or broken cords shall be deemed to have passed the test.

6.2.3. The outer diameter of the tyre, measured six hours after the load/speed endurance test, must not differ by more than ± 3.5 per cent from the outer diameter as measured before the test.

6.2.4. Where application is made for the approval of a type of pneumatic tyre for the load/speed combinations given in the table in annex 8, the endurance test prescribed in paragraph 6.2.1. above need not be carried out for load and speed values other than the nominal values.

6.2.5. Where application is made for the approval of a type of pneumatic tyre which has a load/speed combination in addition to the one that is subject to the variation of load with speed given in the table in annex 8, the endurance test prescribed in paragraph 6.2.1. above shall also be carried out on a second tyre of the same type at the additional load/speed combination.

7. MODIFICATION AND EXTENSION OF APPROVAL OF A TYRE TYPE

7.1. Every modification of a tyre type shall be notified to the administrative department which approved the tyre type. That department may then either:

7.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the tyre still meets the requirements; or

7.1.2. Require a further test report from the technical service responsible for carrying out the tests.

7.2. A modification of the tread pattern of the tyre shall not be considered to necessitate a repetition of the tests prescribed in paragraph 6 of this Regulation.

7.3. Confirmation or refusal of approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 5.3. above to the Parties to the Agreement which apply this Regulation.

7.4. The competent authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

8. CONFORMITY OF PRODUCTION

8.1. The pneumatic tyre approved according to this Regulation shall be so manufactured as to conform to the tyre approved by meeting the requirements set forth in paragraph 6 above.

8.2. In order to verify that the requirements of paragraph 8.1. are met, suitable controls of the production shall be carried out.

8.3. The holder of the approval shall in particular:

8.3.1. ensure existence of procedures for the effective control of the quality of products,

8.3.2. have access to the control equipment necessary for checking the conformity to each approved type,

8.3.3. ensure that data of test results are recorded and that annexed documents remain available for a period to be determined in accordance with the administrative service,

8.3.4. analyse the results of each type of test, in order to verify and ensure the stability of the product characteristics making allowance for variation of an industrial production,

8.3.5. ensure that for each type of product at least the tests prescribed in this Regulation are carried out,

8.3.6. ensure that any sampling of samples or test pieces giving evidence of non-conformity with the type of test considered shall give rise to another sampling and another test. All the necessary steps shall be taken to re-establish the conformity of the corresponding production.

8.4. The competent authority which has granted type-approval may at any time verify the conformity control methods applicable to each production unit.

8.4.1. In every inspection, the test books and production survey records shall be represented to the visiting inspector.

8.4.2. The inspector may take samples at random which will be tested in the manufacturer's laboratory. The minimum number of samples may be determined according to the results of the manufacturer's own verification.

8.4.3. When the quality level appears unsatisfactory or when it seems necessary to verify the validity of the tests carried out in application of paragraph 8.4.2., the inspector shall select samples to be sent to the technical service which has conducted the type-approval tests.

8.4.4. The competent authority may carry out any test prescribed in this Regulation.

8.4.5. The normal frequency of inspections authorized by the competent authority shall be one per year. In the case where negative results are recorded during one of these visits, the competent

authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.

9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

9.1. The approval granted in respect of a type of pneumatic tyre pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 8.1. above is not complied with or if the tyres taken from the series have failed to pass the tests prescribed in that paragraph.

9.2. If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a communication form conforming to the model in annex 1 to this Regulation.

10. PRODUCTION DEFINITELY DISCONTINUED

If the holder of an approval completely ceases to manufacture a type of pneumatic tyre approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of copies of the communication form conforming to the model in annex 1 to this Regulation.

11. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, AND OF ADMINISTRATIVE DEPARTMENTS

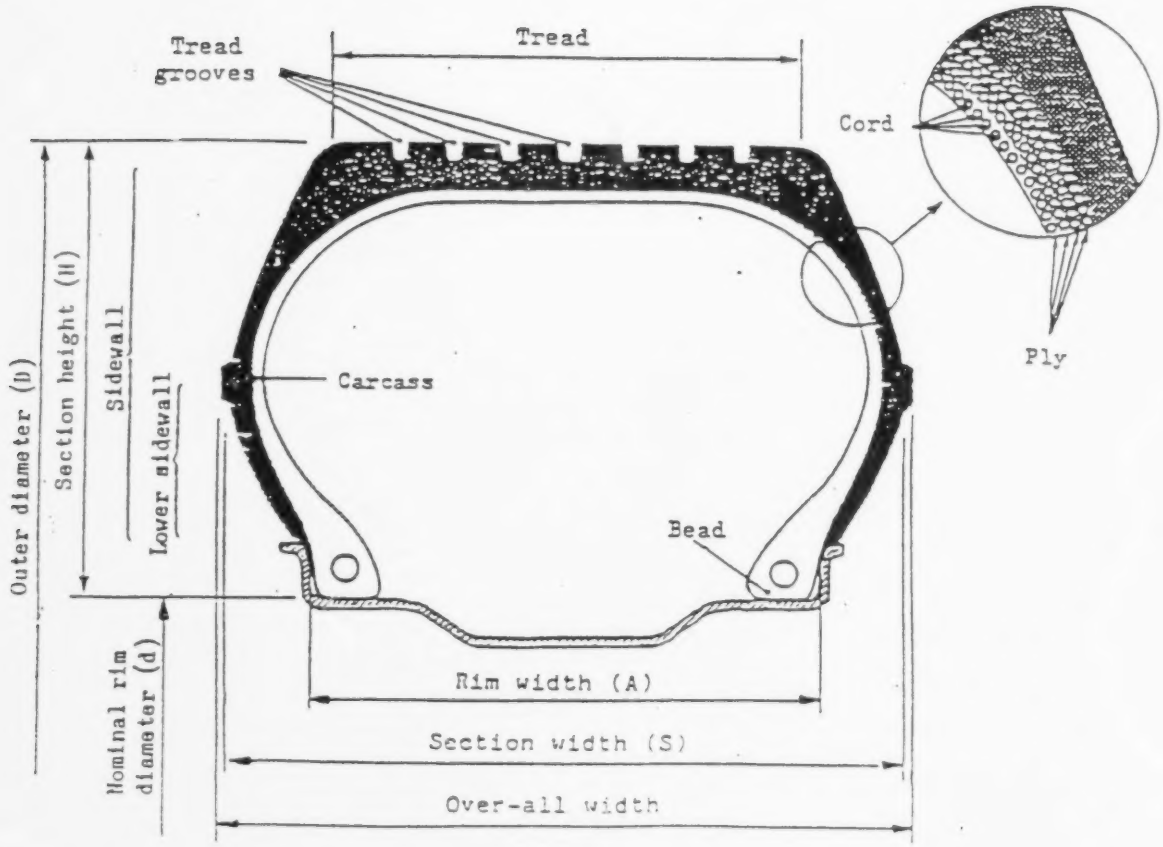
11.1. The Parties to the Agreement which apply this Regulation shall communicate to the United Nations Secretariat the names and addresses of the technical services responsible for conducting approval tests and, where applicable, of the approved test laboratories and of the administrative departments which grant approval and to which forms certifying approval or refusal or withdrawal of approval, issued in other countries, are to be sent.

11.2. The Parties to the Agreement which apply this Regulation may use laboratories of tyre manufacturers and may designate, as approved test laboratories, those among them which are situated on their territory or on the territory of another Party to the Agreement subject to a preliminary agreement to this procedure by the competent administrative department of the latter.

11.3. Where a Party to the Agreement applies paragraph 11.2. above, it may, if it so desires, be represented at the tests by one or more persons of its choice.

Explanatory figure

(See paragraph 2 of the Regulation)



Annex 1

COMMUNICATION

(Maximum format: A4 (210 x 297 mm))

issued by: Name of administration:
.....
.....
.....

concerning: 2/ APPROVAL GRANTED
APPROVAL EXTENDED
APPROVAL REFUSED
APPROVAL WITHDRAWN
PRODUCTION DEFINITELY DISCONTINUED

of a type of pneumatic tyre for motor vehicles pursuant to Regulation No. 54

Approval No. ..... Extension No. .....

1. Manufacturer's name or trade mark on the tyre . . . . . .

2. Tyre type designation by the manufacturer . . . . . .

3. Manufacturer's name and address . . . . . .
. . . . . .

4. If applicable, name and address of manufacturer's representative
. . . . . .
. . . . . .

5. Summarized description:

5.1. Size of tyre . . . . . .

5.2. Category of use: normal/special/snow 2/

5.3. Structure: diagonal (bias-ply)/radial 2/

5.4. Speed category symbol:

5.4.1. nominal . . . . . .

5.4.2. additional (if applicable): . . . . . .

5.5. Load-capacity indices:

5.5.1. Corresponding to nominal speed: single ..... twinned (dual) . . . .

5.5.2. Corresponding to additional speed: single ..... twinned (dual) . . .

6. Technical service and, where applicable, test laboratory approved for purposes of approval or of verification of conformity . . . . . .

7. Date of report issued by that service . . . . . .

8. Number of report issued by that service . . . . . .

9. Reasons(s) of extension (if applicable) . . . . . .

10. Any remarks: . . . . . .

11. Place . . . . . .

12. Date . . . . . .

13. Signature . . . . . .

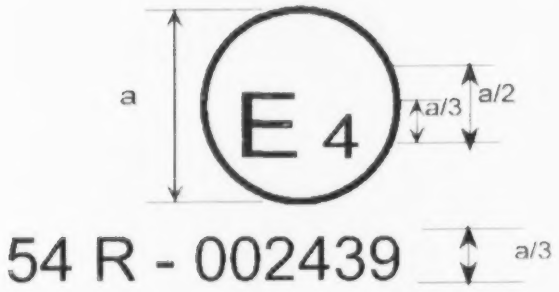
14. Annexed to this communication is a list of documents in the approval file deposited at the administrative services having delivered the approval and which can be obtained upon request.

1/ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

2/ Strike out what does not apply.

Annex 2

ARRANGEMENT OF APPROVAL MARK



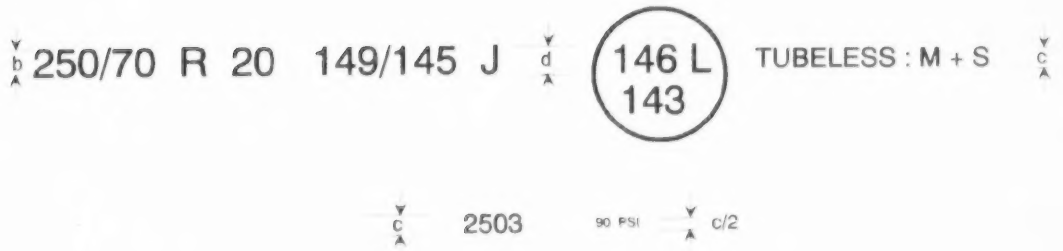
a = 12 mm (min.)

The above approval mark affixed to a pneumatic tyre shows that the type of tyre concerned has been approved in the Netherlands (E 4) under approval number 002439. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. 54 in its original form.

Note: The approval number must be placed close to the circle and either above or below the "E" or to left or right of that letter. The digits of the approval number must be on the same side of the "E" and face in the same direction. The use of Roman numerals as approval numbers should be avoided so as to prevent any confusion with other symbols.

Annex 3

ARRANGEMENT OF TYRE MARKINGS



	MINIMUM HEIGHTS OF MARKINGS (mm)	
	Tyres of rim diameter < 20" or < 508 mm or of section width ≤ 235 mm or ≤ 9"	Tyres of rim diameter ≥ 20" or ≥ 508 mm or of section width > 235 mm or > 9"
b	6	9
c	4	
d	6	

These markings define a pneumatic tyre:

Having a nominal section width of 250;

Having a nominal aspect ratio of 70;

Of radial-ply structure (R);

Having a nominal rim diameter of 508 mm, for which the symbol is 20;

Having load capacities of 3,250 kg when single and 2,900 kg when twinned (dual), corresponding respectively to the load indices 149 and 145 shown in annex 4 to this Regulation;

Classified in the nominal speed category J (reference speed 100 km/h);

Able to be used additionally in speed category L (reference speed 120 km/h) with a load capacity of 3,000 kg when single and 2,725 kg when twinned (dual), corresponding respectively to the load indices 146 and 143 shown in annex 4 to this Regulation;

Capable of being fitted without an inner tube ("TUBELESS") or "snow" type;

Manufactured during the twenty-fifth week of the year 2003; and

Requiring to be inflated to 620 kPa for load/speed endurance tests, for which the PSI symbol is 90.

The positioning and order of the markings constituting the tyre designation shall be the following:

(a) The size designation, comprising the nominal section width, the nominal aspect ratio, the type-of-structure symbol (where applicable) and the nominal rim diameter, shall be grouped as shown in the above example: 250/70 R 20;

(b) The load indices and the symbol of the speed category shall be placed together near the size designation. They may either precede or follow it or be placed above or below it;

(c) The symbol "TUBELESS" and "M+S" may be at a distance from the size designation symbol.

(d) If paragraph 6.2.5. of this Regulation is applied, the additional load-capacity indices and speed-category symbol must be shown inside a circle near the nominal load-capacity indices and speed-category-symbol appearing on the tyre sidewall.

Annex 4

LIST OF SYMBOLS OF LOAD-CAPACITY INDICES

Load-capacity index	Corresponding maximum mass to be carried (kg)
60	250
61	257
62	265
63	272
64	280
65	290
66	300
67	307
68	315
69	325
70	335
71	345
72	355
73	365
74	375
75	387
76	400
77	412
78	425
79	437
80	450
81	462
82	475
83	487
84	500
85	515
86	530
87	545
88	560
89	580
90	600
91	615
92	630
93	650
94	670
95	690
96	710
97	730
98	750
99	775

Load-capacity index	Corresponding maximum mass to be carried (kg)
100	800
101	825
102	850
103	875
104	900
105	925
106	950
107	975
108	1 000
109	1 030
110	1 060
111	1 090
112	1 120
113	1 150
114	1 180
115	1 215
116	1 250
117	1 285
118	1 320
119	1 360
120	1 400
121	1 450
122	1 500
123	1 550
124	1 600
125	1 650
126	1 700
127	1 750
128	1 800
129	1 850
130	1 900
131	1 950
132	2 000
133	2 060
134	2 120
135	2 180
136	2 240
137	2 300
138	2 360
139	2 430

Load-capacity index	Corresponding maximum mass to be carried (kg)
140	2 500
141	2 575
142	2 650
143	2 725
144	2 800
145	2 900
146	3 000
147	3 075
148	3 150
149	3 250
150	3 350
151	3 450
152	3 550
153	3 650
154	3 750
155	3 875
156	4 000
157	4 125
158	4 250
159	4 375
160	4 500
161	4 625
162	4 750
163	4 875
164	5 000
165	5 150
166	5 300
167	5 450
168	5 600
169	5 800
170	6 000
171	6 150
172	6 300
173	6 500
174	6 700
175	6 900
176	7 100
177	7 300
178	7 500
179	7 750

Load-capacity index	Corresponding maximum mass to be carried (kg)
180	8 000
181	8 250
182	8 500
183	8 750
184	9 000
185	9 250
186	9 500
187	9 750
188	10 000
189	10 300
190	10 600
191	10 900
192	11 200
193	11 500
194	11 800
195	12 150
196	12 500
197	12 850
198	13 200
199	13 600
200	14 000

Annex 5

TYRE-SIZE DESIGNATION AND DIMENSIONS

PART I

EUROPEAN TYRES

Table A

CODE DESIGNATED SIZES MOUNTED ON 5° TAPERED RIMS OR FLAT BASE RIMS.
RADIAL AND DIAGONAL CONSTRUCTIONS

Tyre Size Designation (+)	Measuring Rim Width Code	Nominal Rim Diameter d (mm)	Outer Diameter D (mm)		Section Width S (mm)	
			Radial	Diagonal	Radial	Diagonal
Std. series						
4.00R8 (*)	2.50	203	414	414	107	107
4.00R10(*)	3.00	254	466	466	108	108
4.00R12(*)	3.00	305	517	517	108	108
4.50R8 (*)	3.50	203	439	439	125	125
4.50R10(*)	3.50	254	490	490	125	125
4.50R12(*)	3.50	305	545	545	125	128
5.00R8 (*)	3.00	203	467	467	132	132
5.00R10(*)	3.50	254	516	516	134	134
5.00R12(*)	3.50	305	568	568	134	137
6.00R9	4.00	229	540	540	160	160
6.00R14C	4.50	356	626	625	158	158
6.00R16(*)	4.50	406	728	730	170	170
6.50R10	5.00	254	588	588	177	177
6.50R14C	5.00	356	640	650	170	172
6.50R16(*)	4.50	406	742	748	176	176
6.50R20(*)	5.00	508	860	-	181	-
7.00R12	5.00	305	672	672	192	192
7.00R14C	5.00	356	650	668	180	182
7.00R15(*)	5.00	381	746	752	197	198
7.00R16C	5.50	406	778	778	198	198
7.00R16	5.50	406	784	774	198	198
7.00R20	5.50	508	892	898	198	198
7.50R10	5.50	254	645	645	207	207
7.50R14C	5.50	356	686	692	195	192
7.50R15(*)	6.00	381	772	772	212	212
7.50R16(*)	6.00	406	802	806	210	210
7.50R17(*)	6.00	432	852	852	210	210
7.50R20	6.00	508	928	928	210	213
8.25R15	6.50	381	836	836	230	234
8.25R16	6.50	406	860	860	230	234
8.25R17	6.50	432	886	895	230	234
8.25R20	6.50	508	962	970	230	234
9.00R15	6.00	381	840	840	249	249
9.00R16(*)	6.50	406	912	900	246	252
9.00R20	7.00	508	1018	1012	258	256
10.00R15	7.50	381	918	918	275	275
10.00R20	7.50	508	1052	1050	275	275
10.00R22	7.50	559	1102	1102	275	275
11.00R16	6.50	406	980	952	279	272
11.00R20	8.00	508	1082	1080	286	291
11.00R22	8.00	559	1132	1130	286	291
11.00R24	8.00	610	1182	1180	286	291

Table A - (cont'd)

Tyre size designation (+)	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm)		Section Width S (mm)	
			Radial	Diagonal	Radial	Diagonal
12.00R20	8.50	508	1122	1120	313	312
12.00R22	8.50	559	1174	1174	313	312
12.00R24	8.50	610	1226	1220	313	312
13.00R20	9.00	508	1176	1170	336	342
14.00R20	10.00	508	1238	1238	370	375
14.00R24	10.00	610	1340	1340	370	375
16.00R20	13.00	508	1370	1370	446	446
80 Series						
12/80 R 20	8.50	508	1008	-	305	-
13/80 R 20	9.00	508	1048	-	326	-
14/80 R 20	10.00	508	1090	-	350	-
14/80 R 24	10.00	610	1192	-	350	-
14.75/80 R 20	10.00	508	1124	-	370	-
15.5/80 R 20	10.00	508	1158	-	384	-
Wide Base Tyres for Multipurpose Trucks						
7.50 R 18 MPT	5.50	457	885			208
10.5 R 18 MPT	9	457	905		276	270
10.5 R 20 MPT	9	508	955		276	270
12.5 R 18 MPT	11	457	990		330	325
12.5 R 20 MPT	11	508	1040		330	325
14.5 R 20 MPT	11	508	1095		362	355
14.5 R 24 MPT	11	610	1195		362	355

(+) Tyres in diagonal construction are identified by an hyphen in place of the letter 'R' (e.g. 5.00-8).

(*) The tyre size designation may be supplemented with the letter 'C' (e.g. 6.00-16C).

Table B

CODE DESIGNATED SIZES MOUNTED ON 15° TAPERED RIMS - RADIAL

Tyre size designation	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm)	Section Width S (mm)
7 R 17.5 (*)	5.25	445	752	185
7 R 19.5	5.25	495	800	185
8 R 17.5 (*)	6.00	445	784	208
8 R 19.5	6.00	495	856	208
8 R 22.5	6.00	572	936	208
8.5 R 17.5	6.00	445	802	215
9 R 17.5	6.75	445	820	230
9 R 19.5	6.75	495	894	230
9 R 22.5	6.75	572	970	230
9.5 R 17.5	6.75	445	842	240
9.5 R 19.5	6.75	495	916	240
10 R 17.5	7.50	445	858	254
10 R 19.5	7.50	495	936	254
10 R 22.5	7.50	572	1020	254
11 R 22.5	8.25	572	1050	279
11 R 24.5	8.25	622	1100	279
12 R 22.5	9.00	572	1084	300
13 R 22.5	9.75	572	1124	320
15 R 19.5	11.75	495	998	387
15 R 22.5	11.75	572	1074	387
16.5 R 19.5	13.00	495	1046	425
16.5 R 22.5	13.00	572	1122	425
18 R 19.5	14.00	495	1082	457
18 R 22.5	14.00	572	1158	457
70 Series				
10/70 R 22.5	7.50	572	928	254
11/70 R 22.5	8.25	572	962	279
12/70 R 22.5	9.00	572	1000	305
13/70 R 22.5	9.75	572	1033	330

(*) The tyre size designation may be supplemented with the letter 'C' (e.g. 7 R 17.5C).

Table C

TYRES FOR LIGHT COMMERCIAL VEHICLES - RADIAL AND DIAGONAL CONSTRUCTIONS

Tyre size designation (+)	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm)		Section Width S (mm)	
			Radial	Diagonal	Radial	Diagonal
Metric Designated						
145 R 10 C	4.00	254	492	-	147	-
145 R 12 C	4.00	305	542	-	147	-
145 R 13 C	4.00	330	566	-	147	-
145 R 14 C	4.00	356	590	-	147	-
145 R 15 C	4.00	381	616	-	147	-
155 R 12 C	4.50	305	550	-	157	-
155 R 13 C	4.50	330	578	-	157	-
155 R 14 C	4.50	356	604	-	157	-
165 R 13 C	4.50	330	596	-	167	-
165 R 14 C	4.50	356	622	-	167	-
165 R 15 C	4.50	381	646	-	167	-
175 R 13 C	5.00	330	608	-	178	-
175 R 14 C	5.00	356	634	-	178	-
175 R 16 C	5.00	406	684	-	178	-
185 R 13 C	5.50	330	624	-	188	-
185 R 14 C	5.50	356	650	-	188	-
185 R 15 C	5.50	381	674	-	188	-
185 R 16 C	5.50	406	700	-	188	-
195 R 14 C	5.50	356	666	-	198	-
195 R 15 C	5.50	381	690	-	198	-
195 R 16 C	5.50	406	716	-	198	-
205 R 14 C	6.00	356	686	-	208	-
205 R 15 C	6.00	381	710	-	208	-
205 R 16 C	6.00	406	736	-	208	-
215 R 14 C	6.00	356	700	-	218	-
215 R 15 C	6.00	381	724	-	218	-
215 R 16 C	6.00	406	750	-	218	-
245 R 16 C	7.00	406	798	798	248	248
17 R 15 C	5.00	381	678	-	178	-
17 R 380 C	5.00	381	678	-	178	-
17 R 400 C	150 mm	400	698	-	186	-
19 R 400 C	150 mm	400	728	-	200	-
Code Designated						
5.60 R 12 C	4.00	305	570	572	150	148
6.40 R 13 C	5.00	330	648	640	172	172
6.70 R 13 C	5.00	330	660	662	180	180
6.70 R 14 C	5.00	356	688	688	180	180
6.70 R 15 C	5.00	381	712	714	180	180

(+) Tyres in diagonal construction are identified by an hyphen in place of the letter 'R' (e.g. 145-10 C).

Table D

TYRES FOR SPECIAL APPLICATIONS - RADIAL AND DIAGONAL CONSTRUCTION

Tyre size designation (+)	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm)	Section Width S (mm)
Code Designated				
15x4 1/2-8	3.25	203	385	122
16x6-8	4.33	203	425	152
18x7	4.33	203	462	173
18x7-8	4.33	203	462	173
21x8-9	6.00	229	535	200
21x4	2.32	330	565	113
22x4 1/2	3.11	330	595	132
23x5	3.75	330	635	155
23x9-10	6.50	254	595	225
24x7.50-13	6.00	330	597	191
25x6	3.75	330	680	170
27x8.50-14	7.00	356	674	218
27x10-12	8.00	305	690	255
28x8.50-15	7.00	381	699	218
28x9-15	7.00	381	707	216
29x9.50-15	7.50	381	724	240
30x9.50-15	7.50	381	750	240
31x10.50-15	8.50	381	775	268
31x11.50-15	9.00	381	775	290
31x13.50-15	11.00	381	775	345
31x15.50-15	12.00	381	775	390
32x11.50-50	9.00	381	801	290
33x12.50-15	10.00	381	826	318
35x12.50-15	10.00	381	877	318
37x12.50-15	10.00	381	928	318
37x14.50-15	12.00	381	928	372
Metric designated				
200-15	6.50	381	730	205
250-15	7.50	381	735	250
300-15	8.00	381	840	300

(+) Tyres in radial construction are identified by the letter 'R' in place of the hyphen '-' (e.g. 15x4 1/2 R 8).

PART II

UNITED STATES TYRES

- Tolerances shown at the bottom of the tables apply in place of those shown in paras. 6.1.4.2. and 6.1.5.3.

- Outer diameters are listed for the various categories of use: Normal, Snow, Special.

Table A

TYRES FOR LIGHT COMMERCIAL VEHICLES (LT TYRES)

DIAGONAL AND RADIAL

Tyre size designation 1/	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm) 2/		Section width S (mm) 3/
			Normal	Snow	
6.00-16LT	4.50	406	732	743	173
6.50-16LT	4.50	406	755	767	182
6.70-16LT	5.00	406	722	733	191
7.00-13LT	5.00	330	647	658	187
7.00-14LT	5.00	356	670	681	187
7.00-15LT	5.50	381	752	763	202
7.00-16LT	5.50	406	778	788	202
7.10-15LT	5.00	381	738	749	199
7.50-15LT	6.00	381	782	794	220
7.50-16LT	6.00	406	808	819	220
8.25-16LT	6.50	406	859	869	241
9.00-16LT	6.50	406	890	903	257
G78-15LT	6.00	381	711	722	212
H78-15LT	6.00	381	727	739	222
L78-15LT	6.50	381	749	760	236
L78-16LT	6.50	406	775	786	236
7-14.5LT 4/	6.00	368	677		185
8-14.5LT 4/	6.00	368	707		203
9-14.5LT 4/	7.00	368	711		241
7-17.5LT	5.25	445	758	769	189
8-17.5LT	5.25	445	788	799	199

1/ Tyres in Radial construction are identified by the letter "R" in place of "-" (e.g. 6.00 R 16LT).
2/ Coefficient "b" for the calculation of Dmax: 1.08.
3/ Overall width may exceed this value up to +8 per cent.
4/ The suffix "MH"' may replace "LT" in the tyre size designation (e.g. 7-14.5 MH).

Table B

TYRES FOR LIGHT COMMERCIAL VEHICLES (HIGH FLOTATION TYRES)

DIAGONAL AND RADIAL

Tyre size designation 1/	Measuring rim width code	Nominal rim diameter d(mm)	Outer diameter D(mm) 2/ Normal	Outer diameter D(mm) 2/ Snow	Section width S(mm) 3/
9-15LT	8.00	381	744	755	254
10-15LT	8.00	381	773	783	264
11-15LT	8.00	381	777	788	279
24x7.50-13LT	6	330	597	604	191
27x8.50-14LT	7	356	674	680	218
28x8.50-15LT	7	381	699	705	218
29x9.50-15LT	7.5	381	724	731	240
30x9.50-15LT	7.5	381	750	756	240
31x10.50-15LT	8.5	381	775	781	268
31x11.50-15LT	9	381	775	781	290
31x13.50-15LT	11	381	775	781	345
31x15.50-15LT	12	381	775	781	390
32x11.50-15LT	9	381	801	807	290
33x12.50-15LT	10	381	826	832	318
35x12.50-15LT	10	381	877	883	318
37x12.50-15LT	10	381	928	934	318
37x14.50-15LT	12	381	928	934	372
8.00-16.5LT	6.00	419	720	730	203
8.75-16.5LT	6.75	419	748	759	222
9.50-16.5LT	6.75	419	776	787	241
10-16.5LT	8.25	419	762	773	264
12-16.5LT	9.75	419	818	831	307
30x9.50-16.5LT	7.50	419	750	761	240
31x10.50-16.5LT	8.25	419	775	787	266
33x12.50-16.5LT	9.75	419	826	838	315
37x12.50-16.5LT	9.75	419	928	939	315
37x14.50-16.5LT	11.25	419	928	939	365

1/ Tyres in Radial construction are identified by the letter "R" in place of "-" (e.g. 24x7.50 R 13LT).

2/ Coefficient 'b' for the calculation of Dmax: 1.07.

3/ Overall width may exceed this value up to +7 per cent.

Table C

CODE DESIGNATED TYRES MOUNTED ON 5° TAPERED OR FLAT BASE RIMS

DIAGONAL AND RADIAL

Tyre size designation 1/	Measuring rim width code	Nominal rim diameter d(mm)	Outer diameter D(mm) 2/ Normal (a)	Normal (b)	Snow	Section width S(mm) 3/
6.50-20	5	508	878		893	184
7.00-15TR	5.5	381	777		792	199
7.00-18	5.5	457	853		868	199
7.00-20	5.5	508	904		919	199
7.50-15TR	6	381	808		825	215
7.50-17	6	432	859		876	215
7.50-18	6	457	884		901	215
7.50-20	6	508	935		952	215
8.25-15TR	6.5	381	847	855	865	236
8.25-20	6.5	508	974	982	992	236
9.00-15TR	7	381	891	904	911	259
9.00-20	7	508	1019	1031	1038	259
10.00-15TR	7.5	381	927	940	946	278
10.00-20	7.5	508	1054	1067	1073	278
10.00-22	7.5	559	1104	1118	1123	278
11.00-20	8	508	1085	1099	1104	293
11.00-22	8	559	1135	1150	1155	293
11.00-24	8	610	1186	1201	1206	293
11.50-20	8	508	1085	1099	1104	296
12.00-20	8.5	508	1125		1146	315
12.00-24	8.5	610	1226		1247	315
14.00-20	10	508	1241		1266	375
14.00-24	10	610	1343		1368	375

1/ Tyres in Radial construction are identified by the letter "R" in place of "-".(e.g. 6.50 R 20).

2/ Coefficient 'b' for the calculation of Dmax : 1.06 . Category of use: Normal Service tyres: (a) Highway tread (b) Heavy tread

3/ Overall width may exceed this value up to +6 per cent.

Table D

CODE DESIGNATED TYRES FOR SPECIAL SERVICES

DIAGONAL

Tyre size designation	Measuring rim width code	Nominal rim diameter d(mm)	Outer diameter D(mm) 1/ (a)	(b)	Section width S(mm) 2/
10.00-20ML	7.5	508	1073	1099	278
11.00-22ML	8	559	1155	1182	293
13.00-24ML	9	610	1302		340
14.00-20ML	10	508	1266		375
14.00-24ML	10	610	1368		375
15-19.5ML	11.75	495	1019		389

1/ Coefficient "b" for the calculation of Dmax : 1.06.
Category of use: special (a) Traction tread (b) Heavy tread

2/ Overall width may exceed this value up to +8 per cent.

Table E

CODE DESIGNATED TYRES MOUNTED ON 15° TAPERED RIMS

DIAGONAL AND RADIAL

Tyre size designation 1/	Measuring rim width code	Nominal rim diameter d(mm)	Outer diameter D(mm) 2/ Normal (a)	Normal (b)	Snow	Section width S(mm) 3/
8-19.5	6.00	495	859		876	203
8-22.5	6.00	572	935		952	203
9-22.5	6.75	572	974	982	992	229
10-22.5	7.50	572	1019	1031	1038	254
11-22.5	8.25	572	1054	1067	1073	279
11-24.5	8.25	622	1104	1118	1123	279
12-22.5	9.00	572	1085	1099	1104	300
12-24.5	9.00	622	1135	1150	1155	300
12.5-22.5	9.00	572	1085	1099	1104	302
12.5-24.5	9.00	622	1135	1150	1155	302
14-17.5	10.50	445	907		921	349 (-)
15-19.5	11.75	495	1005		1019	389 (-)
15-22.5	11.75	572	1082		1095	389 (-)
16.5-22.5	13.00	572	1128		1144	425 (-)
18-19.5	14.00	495	1080		1096	457 (-)
18-22.5	14.00	572	1158		1172	457 (-)

1/ Tyres in Radial construction are identified by the letter "R" in place of "-" (e.g. 8R19.5).

2/ Coefficient "b" for the calculation of Dmax : 1.05.
Category of use: Normal Service tyres: (a) Highway tread (b) Heavy tread

3/ Overall width may exceed this value up to +6 per cent
(-)Overall width may exceed this value up to +5 per cent.

Annex 6

METHOD OF MEASURING PNEUMATIC TYRES

1. The tyre is mounted on the measuring rim specified by the manufacturer pursuant to paragraph 4.1.11. of this Regulation and is inflated to a pressure specified by the manufacturer pursuant to paragraph 4.1.12. of this Regulation.

2. The tyre fitted on its rim is conditioned to the ambient temperature of the laboratory for at least 24 hours.

3. The pressure is readjusted to the value specified in paragraph 1. above.

4. The overall width is measured by caliper at six equally-spaced points, account being taken of the thickness of the protective ribs or bands. The highest measurement so obtained is taken as the overall width.

5. The outer diameter is calculated from the maximum circumference.

Annex 7

PROCEDURE FOR LOAD/SPEED ENDURANCE TESTS

1. Preparing the tyre

1.1. Mount a new tyre on the test rim specified by the manufacturer pursuant to paragraph 4.1.11. of this Regulation.

1.2. Use a new inner tube or combination of inner tube, valve and flap (as required) when testing tyres with inner tubes.

1.3. Inflate the tyre to the pressure corresponding to the pressure index specified by the manufacturer pursuant to paragraph 4.1.12. of this Regulation.

1.4. Condition the tyre-and-wheel assembly at test-room temperature for not less than three hours.

1.5. Readjust the tyre pressure to that specified in paragraph 1.3. above.

2. Test procedure

2.1. Mount the tyre-and-wheel assembly on the test axle and press it against the outer face of a smooth power-driven test drum 1.70 m ± 1 per cent in diameter having a surface at least as wide as the tyre tread.

2.2. Apply to the test axle a series of test loads expressed in per cent of the load indicated, in annex 4 to this Regulation, opposite the load index engraved on the sidewall of the tyre, in accordance with the test programme below. Where the tyre has load-capacity indices for both single and twinned utilization, the reference load for single utilization shall be taken as the basis for the test loads.

2.2.1. In the case of a tyre with a load capacity index 121 or less and a speed category above P, test procedures are as specified in paragraph 3.

2.2.2. For all other tyre types, the endurance test programme is shown in appendix 1 to this annex.

2.3. The tyre pressure must not be corrected throughout the test and the test load must be kept constant throughout each of the three test stages.

2.4. During the test the temperature in the test-room must be maintained at between 20°C and 30°C or at a higher temperature if the manufacturer so agrees.

2.5. The endurance-test programme shall be carried out without interruption.

3. Load/speed test programme for tyre with a load capacity index 121 or less and a speed category Q and above

3.1. Load placed on the wheel as a percentage of the load corresponding to the load index:

3.1.1. 90% when tested on a test drum 1.70 m ± 1 per cent in diameter;

3.1.2. 92% when tested on a test drum 2.0 m ± 1 per cent in diameter.

3.2. Initial test speed: speed corresponding to the speed category symbol less 20 km/h;

3.2.1. Time to reach the initial test speed 10 min.

3.2.2. Duration of the first step = 10 min.

3.3. Second test speed: speed corresponding to the speed category symbol less 10 km/h;

3.3.1. Duration of the second step = 10 min.

3.4. Final test speed: speed corresponding to the speed category symbol:

3.4.1. Duration of the final step = 30 min.

3.5. Total test duration: 1 h.

4. Equivalent test methods

If a method other than that described in paragraph 2. above is used, its equivalence must be demonstrated.

Annex 7 - Appendix 1

ENDURANCE-TEST PROGRAMME

Load index	Tyre speed category	Test-drum speed		Load placed on the wheel as a percentage of the load corresponding to the load index		
		Radial-ply min^{-1}	Diagonal (bias-ply) min^{-1}	7 h.	16 h.	24 h.
122 or more	F	100	100			
	G	125	100			
	J	150	125			
	K	175	150			
	L	200	-			
	M	225	-	66%	84%	101%
121 or less	F	100	100			
	G	125	125			
	J	150	150			
	K	175	175			
	L	200	175	70% 4 h.	88% 6 h.	106%
	M	250	200	75%	97%	114%
	N	275	-	75%	97%	114%
	P	300	-	75%	97%	114%

Notes:

(1) "Special-use" tyres (see paragraph 2.1.3. of the Regulation) should be tested at a speed equal to 85 per cent of the speed prescribed for equivalent normal tyres.

(2) Tyres with a Load Index of 122 or more of speed categories above M are not yet produced. Approval cannot be granted to them under this Regulation.

Annex 7 - Appendix 2

RELATION BETWEEN THE PRESSURE INDEX AND THE UNITS OF PRESSURE

Pressure Index ("PSI")	Bar	kPa
20	1.4	140
25	1.7	170
30	2.1	210
35	2.4	240
40	2.8	280
45	3.1	310
50	3.4	340
55	3.8	380
60	4.1	410
65	4.5	450
70	4.8	480
75	5.2	520
80	5.5	550
85	5.9	590
90	6.2	620
95	6.6	660
100	6.9	690
105	7.2	720
110	7.6	760
115	7.9	790
120	8.3	830
125	8.6	860
130	9.0	900
135	9.3	930
140	9.7	970
145	10.0	1000
150	10.3	1030
...	...	...

Annex 8

VARIATION OF LOAD CAPACITY WITH SPEED COMMERCIAL VEHICLES TYRES
RADIAL AND DIAGONAL
(See paras. 2.27. and 2.29.)

Variation of load capacity (per cent)										
Speed (km/h)	All load indices				Load indices ≥ 122 1/		Load indices ≤ 121 1/			
	Speed category symbol				Speed category symbol		Speed category symbol			
	F	G	J	K	L	M	L	M	N	P2/
0	+150	+150	+150	+150	+150	+150	+110	+110	+110	+110
5	+110	+110	+110	+110	+110	+110	+90	+90	+90	+90
10	+80	+80	+80	+80	+80	+80	+75	+75	+75	+75
15	+65	+65	+65	+65	+65	+65	+60	+60	+60	+60
20	+50	+50	+50	+50	+50	+50	+50	+50	+50	+50
25	+35	+35	+35	+35	+35	+35	+42	+42	+42	+42
30	+25	+25	+25	+25	+25	+25	+35	+35	+35	+35
35	+19	+19	+19	+19	+19	+19	+29	+29	+29	+29
40	+15	+15	+15	+15	+15	+15	+25	+25	+25	+25
45	+13	+13	+13	+13	+13	+13	+22	+22	+22	+22
50	+12	+12	+12	+12	+12	+12	+20	+20	+20	+20
55	+11	+11	+11	+11	+11	+11	+17.5	+17.5	+17.5	+17.5
60	+10	+10	+10	+10	+10	+10	+15.0	+15.0	+15.0	+15.0
65	+7.5	+8.5	+8.5	+8.5	+8.5	+8.5	+13.5	+13.5	+13.5	+13.5
70	+5.0	+7.0	+7.0	+7.0	+7.0	+7.0	+12.5	+12.5	+12.5	+12.5
75	+2.5	+5.5	+5.5	+5.5	+5.5	+5.5	+11.0	+11.0	+11.0	+11.0
80	0	+4.0	+4.0	+4.0	+4.0	+4.0	+10.0	+10.0	+10.0	+10.0
85	-3	+2.0	+3.0	+3.0	+3.0	+3.0	+8.5	+8.5	+8.5	+8.5
90	-6	0	+2.0	+2.0	+2.0	+2.0	+7.5	+7.5	+7.5	+7.5
95	-10	-2.5	+1.0	+1.0	+1.0	+1.0	+6.5	+6.5	+6.5	+6.5
100	-15	-5	0	0	0	0	+5.0	+5.0	+5.0	+5.0
105		-8	-2	0	0	0	+3.75	+3.75	+3.75	+3.75
110		-13	-4	0	0	0	+2.5	+2.5	+2.5	+2.5
115			-7	-3	0	0	+1.25	+1.25	+1.25	+1.25
120			-12	-7	0	0	0	0	0	0
125						0	-2.5	0	0	0
130						0	-5.0	0	0	0
135							-7.5	-2.5	0	0
140							-10	-5	0	0
145								-7.5	-2.5	0
150								-10.0	-5.0	0
155									-7.5	-2.5
160									10.0	-5.0

1/ The load capacity indices refer to a single operation.
2/ Load variations are not allowed for speeds above 160 km/h. For speed category symbols "Q" and above the speed category corresponding to the speed category symbol (see paragraph 2.28.2.) specifies the maximum speed permitted for the tyre.